LISTING OF THE CLAIMS

1. (original) A method for reducing a relative intensity noise of a fiber grating type laser diode including a fiber grating and a laser diode, comprising:

detecting at least a portion of an optical signal of said fiber grating type laser diode;

determining the relative intensity noise of said laser diode using said detected optical signal; and

reducing a difference between a maximum gain wavelength of said laser diode and a maximum reflection wavelength of a fiber grating of said fiber grating type laser diode in a manner tending to reduce the relative intensity noise of said fiber grating type laser diode.

2. (original) The method of claim 1, wherein said portion of the optical signal detected is a reflected portion of an optical signal of said laser diode, said optical signal being reflected by said fiber grating.

3. (original) The method of claim 2, wherein the reflected portion of the optical signal of said laser diode is detected by a detector positioned on a front face of said laser diode.

4. (original) The method of claim 1, wherein said relative intensity noise is determined by detecting a change in intensity of an output power of said detected optical signal as a function of time.

5. (original) The method of claim 1, wherein the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is determined from said detected optical signal.

6. (original) The method of claim 1, wherein the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is reduced by adjusting the maximum gain wavelength of said laser diode.

7. (original) The method of claim 6, wherein the maximum gain wavelength of said laser diode is adjusted by adjusting an amount of a current injection applied to said laser diode.

8. (original) The method of claim 6, wherein the maximum gain wavelength of said laser diode is adjusted by altering the temperature of said laser diode.

9. (original) The method of claim 8, wherein the temperature of said laser diode is altered by adjusting a thermo-electric cooler of said laser diode.

10. (withdrawn) The method of claim 1, wherein the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is reduced by adjusting the maximum reflection wavelength of said fiber grating.

11. (withdrawn) The method of claim 10, wherein the maximum reflection wavelength of said fiber grating is adjusted by altering the temperature of said fiber grating.

12. (withdrawn) The method of claim 11, wherein the temperature of said fiber grating is altered by adjusting a thermo-electric cooler of said fiber grating.

13. (original) The method of claim 1, wherein the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is reduced by adjusting the wavelength of at least one of the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating.

14. (original) A relative intensity noise (RIN) control device for controlling the RIN of a fiber grating type laser diode including a fiber grating and a laser diode, comprising:

an optical detector for detecting at least a portion of an optical signal of said fiber grating type laser diode; and

a control unit comprising a memory for storing information and program instructions and a processor for executing said instructions, said control unit adapted to perform the steps of:

determining, from said detected optical signal, the relative intensity noise of said laser diode; and

reducing a difference between a maximum gain wavelength of said laser diode and a maximum reflection wavelength of said fiber grating in a manner tending to reduce the relative intensity noise of said laser diode.

15. (original) The RIN control device of claim 14, wherein the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is determined by said control unit from said detected optical signal.

16. (original) The RIN control device of claim 14, wherein said control unit comprises a look-up table in said memory for correlating a difference between a maximum gain wavelength of said laser diode and a maximum reflection wavelength of said fiber grating with a corresponding relative intensity noise level, and the difference between

the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is determined by said control unit using said determined relative intensity noise and said look-up table.

17. (original) The RIN control device of claim 14, wherein said control unit is further adapted to generate a control signal to adjust the maximum gain wavelength of said laser diode such that the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is reduced.

18. (original) The RIN control device of claim 17, wherein said control signal is adapted to adjust an amount of a current injection applied to said laser diode.

19. (original) The RIN control device of claim 17, wherein said control signal is adapted to adjust a temperature of said laser diode.

20. (withdrawn) The RIN control device of claim 14, wherein said control unit is further adapted to generate a control signal to adjust the maximum reflection wavelength of said fiber grating such that the difference between the maximum gain wavelength of said laser diode and the maximum reflection wavelength of said fiber grating is reduced.

21. (withdrawn) The RIN control device of claim 20, wherein said control signal is adapted to adjust a temperature of said fiber grating.

22. (original) A relative intensity noise (RIN) controlled fiber grating type laser diode, comprising:

a laser diode for providing an optical signal;

a fiber grating for reflecting at least a portion of said optical signal back toward said laser diode and transmitting the remaining portion of said optical signal;

an optical detector for detecting at least one of said reflected portion of said optical signal and said transmitted portion of said optical signal; and

a control unit comprising a memory for storing information and program instructions and a processor for executing said instructions, said control unit adapted to perform the steps of:

determining the relative intensity noise of said laser diode from said detected optical signal; and

reducing a difference between a maximum gain wavelength of said laser diode and a maximum reflection wavelength of said fiber grating in a manner tending to reduce the relative intensity noise of said laser diode.

23. (original) The RIN controlled fiber grating type laser diode of claim 22, wherein said fiber grating is etched near a guided-mode portion of an optical fiber of said RIN controlled fiber grating type laser diode, said optical fiber used for propagating optical signals of said laser diode.

24. (original) The RIN controlled fiber grating type laser diode of claim 22, wherein said fiber grating is formed in an optical fiber of said RIN controlled fiber grating type laser diode by exposing said optical fiber to a pattern of periodic intensity variations of high influence ultraviolet light.

25. (original) The RIN controlled fiber grating type laser diode of claim 24, wherein a core of said optical fiber has a concentration of germanium to render the core sensitive to the ultraviolet light.

26. (original) The RIN controlled fiber grating type laser diode of claim 22, further comprising an optical isolator located further downstream from said fiber grating for preventing optical signals from traveling upstream to said laser diode.

27. (original) The RIN controlled fiber grating type laser diode of claim 22, wherein said optical detector is positioned at a front facet of said laser diode for detecting the reflected portion of the optical signal.